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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,579	03/11/2004	Eun-sung Lee	Q80074	4816
23373	7590	11/01/2005	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			TADESSE, YEWEBDAR T	
			ART UNIT	PAPER NUMBER
			1734	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/797,579

Applicant(s)

LEE ET AL.

Examiner

Yewebdar T. Tadesse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-7 and 9-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 071505.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. In the amendment filed on 08/12/2005, applicants have added new claims 9-13.

Claims 1-2, 4-7 and 9-13 have been examined as follow:

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 7 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Benson (US 2004/0126923).

Benson discloses (see Figs 1-3) a spin coating apparatus for coating photoresist, comprising: a spin chuck (9) for rotating a wafer; a nozzle part (15) for depositing photoresist onto a wafer mounted on the spin chuck; and a gas exhaust part (23) disposed above the wafer (1) so that gas is exhausted from an edge of the wafer in a turning direction of the wafer and a centrifugal direction upon rotation of the wafer (see the direction of stream 25) to remove an edge-bead.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-2, 4 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheu et al (US 4,024,835) in view of Sago et al (US 6,436,472).

As to claim 1, Scheu et al discloses (see Figs 2 and 3B) a spin coating apparatus for coating photoresist, comprising a spin chuck comprising a mount part (recessed area 305), for mounting a wafer thereon, and an extended projection part (see Figure 3B) for facilitating formation of an edge-bead (uneven resist coating on the edge of the substrate, see column 2, lines 7-11) thereon. Although Scheu et al discloses a spinner chuck for applying a photoresist coating to a substrate mounted on the mount part of the spin chuck, a nozzle for depositing photoresist is not taught in Scheu et al. However, it is well known in the art to use a nozzle for dispensing photoresist coating material onto

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the substrate to apply the coating solution; for instance Sago et al discloses (see Fig 2) a nozzle (6) for depositing photoresist onto a wafer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Scheu et al to apply the coating material onto the wafer.

With respect to claim 2, Scheu et al lacks teaching the extended projection part of the spin chuck having a height lower than that of the wafer mounted on the mount part. However, a wafer having a height higher than the projection part of the spin chuck can be mounted on the mount part of Scheu et al's chuck depending the type of substrate treated. For instance, Kostler et al (US 2003/0002973) discloses (see paragraph 19) wafers having a height higher than other regular wafers resulted from preceding processing step. Mounting a substrate having irregular thickness, such as shown by Kostler et al on Scheu et al device meets the claimed limitation, wherein the extended projection part of the spin chuck having a height lower than that of the wafer mounted on the mount part. As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a substrate having a chuck having a height higher than the projection part of the spin chuck in Scheu et al depending the type of substrates treated.

As to claims 4 and 10, in Scheu et al (see Fig 3A) the extended projection part of the spin chuck surrounds a circumference of the wafer. As to the circumference of the wafer being in contact with the mount part, it depends with the type of the substrate treated as explained above. Mounting a substrate having irregular thickness, such as shown by Kostler et al on Scheu et al device results the claimed limitation, wherein the

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circumference of the wafer being in contact with the mount part (recessed area 305).

As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made to keep the mount part in contact with the circumference of the wafer in Scheu et al depending the type of substrates treated.

With respect to claim 9, in Scheu et al (see Fig 3B) the extended projection part of the spin chuck is physically attached to the mount part of the spin chuck.

7. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheu et al (US 4,024,835) in view of Sago et al (US 6,436,472) as applied to claim 1 above, and further in view of Ikeda (US 5,342,738) and Akaike et al (US 6,307,390). Scheu et al teaches a vacuum or suction applied through an opening 320 to hold the wafer upon the chuck, which is capable of being removed to separate the wafer from the chuck. However, a separation part comprising removable plugs that are inserted through corresponding holes in the spin chuck to push against the bottom of the wafer and separate the wafer from the spin chuck is not taught in Scheu et al. In any event, Ikeda discloses (see Figs 5a-5c) a separation part discloses removable plugs (51a and 51b pins) pushing against the bottom of the wafer to separate the wafer from the wafer chuck (2). Akaike et al also discloses (see Fig 5A) plugs (pins 15B) inserted through holes (56) to separate (transmit) the wafer from the wafer chuck 50. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a separation part comprising removable plugs that are inserted through corresponding holes in the spin chuck to push against the bottom of the wafer and separate the wafer

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from the spin chuck to transfer the wafer to the next processing station or to treat the bottom side of the wafer.

8. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheu et al (US 4,024,835) in view of Sago et al (US 6,436,472) as applied to claim 1 above, and further in view of Berman et al (US 6,837,967) or Benson (US 20004/0126923). Scheu et al lacks teaching a gas exhaust part disposed above the wafer so that gas is exhausted from an edge of the wafer in a turning direction of the wafer and a centrifugal direction upon rotation of the wafer. Berman discloses (see Fig 1) a gas manifold directed to the edge portions of the wafer, in which part of the gas manifold located above the wafer and is considered to apply gas in a turning direction of the wafer and a centrifugal direction upon rotation of the wafer (see apertures 108 located at the edges of both sides of the upper air manifold). Benson discloses (see Fig 2 and paragraph 34) an air knife disposed above the wafer (1) directing a stream of gas towards edge bead 21 in a turning direction of the wafer and a centrifugal direction upon rotation of the wafer (see the direction of stream 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a gas exhaust part in Scheu et al to remove or clean the edge bead from the semiconductor wafer.


Response to Arguments

9. Applicant's arguments with respect to claims 1-2 and 4-7 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


YTT